

AMENDMENTS TO THE CLAIMS

The following listing of claims replaces all prior versions, and listings, of claims in the captioned patent application:

Listing of Claims:

Claims 1-44. (Canceled)

Claim 45. (Currently Amended) A printed circuit board comprising:

- a printed wiring board;
- at least one component mounted on the printed wiring board; and
- a thermally conductive dielectric coating adhered to surfaces of the printed circuit board and comprising an electrically nonconductive thermal loading material, wherein the dielectric coating is formed from a dispersion ~~is formed by applying a dispersion to the printed circuit board surfaces, the dispersion having a~~ with a viscosity and adhesion sufficient to enable the dispersion to be applied via spray techniques.

Claim 46. (Previously Presented) The printed circuit board of claim 45, wherein the printed circuit board further comprises:

- a conductive coating adhered to surfaces of the dielectric coating.

Claim 47. (Previously Presented) The printed circuit board of claim 45, wherein the dispersion comprises: a base liquid; a binder material suspended in the base liquid; and the electrically nonconductive thermal loading material suspended in the base liquid.

Claim 48. (Previously Presented) The printed circuit board of claim 45, wherein the thermal loading material comprises one of the group consisting of boron nitride (BN), aluminum oxide (AlO₃) and magnesium oxide (MgO).

Claim 49. (Previously Presented) The printed circuit board of claim 47, wherein the binder material comprises one of the group consisting of acrylic and urethane.

Claim 50. (Previously Presented) The printed circuit board of claim 47, wherein the base liquid and binder material are provided in an intermediate dispersion subsequently doped with the thermal loading material.

Claim 51. (Previously Presented) The printed circuit board of claim 47, wherein the base liquid is one of either water or an organic solvent.

Claim 52. (Previously Presented) The printed circuit board of claim 51, wherein the organic solvent comprises one or more of the group consisting of:

- N-Methyl-Pyrolidinone (NMP);
- Methyl-Ethyl-Ketone (MEK);
- an acetone; and
- an alcohol.

Claim 53. (Previously Presented) The printed circuit board of claim 48, wherein said boron nitride comprises one or more of the group consisting of:

- hexagonal boron nitride; and
- diamond boron nitride.

Claim 54. (Previously Presented) The printed circuit board of claim 47, wherein the thermal loading material comprises a 0.1-10 micron boron nitride powder.

Claim 55. (Previously Presented) The printed circuit board of claim 45, wherein said dispersion viscosity and adhesion that prevents dewetting when said dispersion is applied to surfaces of the printed circuit board.

Claim 56. (Previously Presented) The printed circuit board of claim 47, wherein said suspension of said thermal loading material is substantially uniform when said dielectric dispersion is applied to said printed circuit board surfaces.

Claim 57. (Previously Presented) The printed circuit board of claim 47, wherein said dispersion further comprises one or more of the group consisting of:

- at least one photosensitizing agent to enable said dispersion to be UV cured; and
- at least one heat-curing agent to enable said dispersion to be temperature cured.

Claim 58. (Previously Presented) The printed circuit board of claim 57, wherein said photosensitizing agent is a UV-curable acrylic.

Claim 59. (Previously Presented) The printed circuit board of claim 57, wherein said heat-curing agent is an anhydride.

Claim 60. (Previously Presented) The printed circuit board of claim 45, wherein the thermal loading material is 10%-80% and the binder is 90%-20% by weight of the thermally conductive dielectric dispersion.

Claim 61. (Previously Presented) The printed circuit board of claim 45, wherein the thermal loading material comprises a 100 mesh, 99% corundum, alpha-phase aluminum oxide powder.

Claim 62. (Previously Presented) The printed circuit board of claim 45, wherein the thermally conductive dielectric coating has a viscosity of at least 45" #2 Zahn Cup (full body).

Claim 63. (Previously Presented) The printed circuit board of claim 45, wherein the thermally conductive dielectric coating has a viscosity in the range of 50-100" #2 Zahn Cup (full body).

Claim 64. (Previously Presented) The printed circuit board of claim 45, wherein the thermally conductive dielectric coating has an adhesion that enables it to pass the ASTM D-3359-97 Method A Tape Test using a 1" (25 mm wide) semi-transparent pressure-sensitive tape with an adhesion strength of 25-70 ounces per inch when tested in accordance with ASTM Test Method D-3330.

Claim 65. (Previously Presented) The printed circuit board of claim 45, wherein the thermally conductive dielectric coating has a thickness of approximately .0015 to .0020 inches.

Claim 66. (Previously Presented) The printed circuit board of claim 45, wherein the thermally conductive dielectric coating is formed from multiple applications each forming a layer of thermally conductive dielectric material having a thickness of approximately .001 inches.

Claim 67. (Canceled)

Claim 68. (Previously Presented) The printed circuit board of claim 45, wherein the thermal loading material has a conductivity of at least 20 W/mK.

Claim 69. (Previously Presented) The printed circuit board of claim 45, wherein the thermal loading material has a conductivity of at least 100 W/mK.

Claims 70. – 75. (Canceled)

Claim 76. (Previously Presented) A printed circuit board comprising:

- a printed wiring board;
- at least one component mounted on the printed wiring board; and
- a thermally conductive dielectric coating adhered to surfaces of the printed circuit board, wherein the dielectric coating is formed from a dispersion comprising a base liquid, a binder material suspended in the base liquid, and an electrically nonconductive thermal loading material suspended in the base liquid.

Claim 77. (Previously Presented) The printed circuit board of claim 76, wherein the printed circuit board further comprises:

- a conductive coating adhered to surfaces of the dielectric coating.

Claim 78. (Previously Presented) The printed circuit board of claim 76, wherein the thermal loading material comprises boron nitride (BN).

Claim 79. (Previously Presented) The printed circuit board of claim 76, wherein the thermal loading material comprises aluminum oxide (AlO₃).

Claim 80. (Previously Presented) The printed circuit board of claim 76, wherein the thermal loading material comprises magnesium oxide (MgO).

Claim 81. (Previously Presented) The printed circuit board of claim 76, wherein the binder material comprises one of a group consisting of acrylic and urethane.

Claim 82. (Previously Presented) The printed circuit board of claim 76, wherein the base liquid is one of either water or an organic solvent.

Claim 83. (Previously Presented) The printed circuit board of claim 82, wherein the organic solvent comprises one or more of the group consisting of:

- N-Methyl-Pyrrolidinone (NMP);
- Methyl-Ethyl-Ketone (MEK);
- an acetone; and
- an alcohol.

Claim 84. (Previously Presented) The printed circuit board of claim 76, wherein the dispersion has a viscosity and adhesion that prevents dewetting when the dispersion is applied to surfaces of the printed circuit board.

Claim 85. (Previously Presented) The printed circuit board of claim 76, wherein the thermal loading material has a conductivity of at least approximately 20 W/mK.

Claim 86. (Currently Amended) A printed circuit board comprising:

- a printed wiring board;
- at least one component mounted on the printed wiring board; and
- a thermally conductive dielectric coating adhered to surfaces of the printed circuit board and comprising an electrically nonconductive thermal loading material having a thermal conductivity of at least ~~approximately 20~~ approximately 36 W/mK.

Claim 87. (Previously Presented) The printed circuit board of claim 86, wherein the printed circuit board further comprises:

- a conductive coating adhered to surfaces of the dielectric coating.

Claim 88. (Previously Presented) The printed circuit board of claim 86, wherein the thermally conductive dielectric coating is formed from a dispersion comprising a base liquid; a binder material suspended in the base liquid; and the thermal loading material suspended in the base liquid.

Claim 89. (Previously Presented) The printed circuit board of claim 86, wherein the thermal loading material comprises boron nitride (BN).

Claim 90. (Canceled)

Claim 91. (Previously Presented) The printed circuit board of claim 86, wherein the thermal loading material comprises magnesium oxide (MgO).

Claim 92. (Previously Presented) The printed circuit board of claim 88, wherein the binder material comprises one of the group consisting of acrylic and urethane.

Claim 93. (Previously Presented) The printed circuit board of claim 88, wherein the base liquid is one of either water or an organic solvent.

Claim 94. (Currently Amended) The printed circuit board of ~~claim 86~~ claim 88, wherein the dispersion has a viscosity and adhesion that prevents dewetting when the dispersion is applied to surfaces of the printed circuit board.

Claim 95. (New) A printed circuit board comprising:

- a printed wiring board;
 - at least one component mounted on the printed wiring board; and
 - a thermally conductive dielectric coating adhered to surfaces of the printed circuit board and comprising an electrically nonconductive thermal loading material having a thermal conductivity of at least approximately 20 W/mK; and
- wherein the thermally conductive dielectric coating is formed from a dispersion comprising a base liquid; a binder material suspended in the base liquid; and the thermal loading material suspended in the base liquid.

Claim 96. (New) The printed circuit board of claim 95, wherein the binder material comprises one of the group consisting of acrylic and urethane.

Claim 97. (New) The printed circuit board of claim 95, wherein the base liquid is one of either water or an organic solvent.

Claim 98. (New) The printed circuit board of claim 95, wherein the dispersion has a viscosity and adhesion that prevents dewetting when the dispersion is applied to surfaces of the printed circuit board.